REMARKS/ARGUMENTS

The present application contains claims 5 - 22. Claim 4 has been cancelled. Claims 1-3 have been cancelled and respectively replaced by claims 9-11. Claims 12-22 have also been newly added.

It is noted the present Action is a non-final action and that a three (3) month response period has been set. It is submitted that this amendment is being timely filed together with an appropriate request for Extension of Time.

The rejection of claims 1-8 will be addressed below.

It is noted that the specification has been objected to. This matter will be addressed in detail below.

It is noted that: the drawings filed July 11, 2003 have been accepted; the claim for foreign priority has been acknowledged; and further that all of the certified copies of the priority documents have been received.

Making reference to the Detailed Action, the request for a new title is duly noted. It is respectfully requested that the title be change to "METHOD AND APPARATUS FOR DETERMINING A NON-EXISTENT COLOR COMPONENT FOR A PIXEL BY SELECTING AMONG AVERAGES OF SAME COLOR PIXELS NEAR SAID PIXEL BASED ON CALCULATED ESTIMATES OF COLOR CORRELATIONS BETWEEN DIFFERENT COLOR COMPONENTS NEAR THE PIXEL".

Claims 1-8 have been rejected under 35 U.S.C §102(e) as anticipated by Kakarala et al. (Pub '928). This rejection is respectfully traversed as regards 5 – 22, claim 4 having been cancelled and claims 1 – 3 replaced by claims 9 – 11.

Although Pub '981 admittedly teaches methods for interpolating colors at each pixel location, it is submitted that the technique for obtaining non-existent color components for each pixel of an imaging device, as taught in the present application, it is clearly different and patentable as compared with the teachings of '981.

Making reference to Figs. 2 and 4 of '981, it can be seen that **all three (3)** color pixel values (i.e., red, blue and green) are required in order to determine the color for each pixel. Initially, the "R, G, B data 25 is separated into three (3) color planes 25a (R), 25b (G) and 25c (B). Each of the color planes undergo gradient logic (at 100a-100c) and Jacobian logic (at 110), followed by column logic (at 120), wherein the column votes are summed with neighborhood vote data (at 150) to establish the weight determining value alpha (α) (at 160) in order to perform interpolation at logic circuit 170. All of these steps are utilized to determine if a vertical edge or a horizontal edge is present.

To the contrary, the present invention acts on one pixel of interest at a time, calculating a group of values of combinations of pixels of a same color in the neighborhood of the pixel of interest (see Fig. 2A), calculating parameters to be used

together with a function for estimating one kind of color component from a different kind of color component within the region near the pixel of interest, estimating a color component non-existent in the pixel of interest by said function using the calculated parameters and the color component obtained in the pixel of interest and a combination selection circuit for selecting one of the plurality of combination averages calculated by the combination average calculation circuit as the non-existent color component for the pixel of interest based on the color component estimated by the color correlating calculation circuit. These features, which are recited in new claim 9, are neither taught nor remotely suggested by '981. Claim 10 depends from claim 9 and carries all of its limitations and hence is deemed to patentably distinguish over '981 for the same reasons set forth above regarding claim 9. In addition, claim 10 recites calculating the fluctuation of the color component within the combination of two or more pixels and calculating the reliability of the calculated parameters. Although the Examiner refers to paragraphs 68-71 of '981 for allegedly teaching this capability, it is submitted that these paragraphs are limited to teaching horizontal and vertical interpolation which relate to pixels that lie on either a horizontal or vertical edge within an image and these paragraphs relate to determining the direction of a edge and not determining reliability of calculated parameters, as set forth in claim 10. Also, '981 fails to teach

calculating parameters for use in a function and then employing the calculated parameters and said function for estimating a color component.

Claim 4 has been cancelled without prejudice to applicant in order to expedite the prosecution of the present application.

Claims 5 and 6 recite substantially the same limitations recited in claims 9 and 10 in method steps and it is submitted that these claims patentably distinguish over '981 for the same reasons set forth above regarding claims 9 and 10. Method claim 5 recites substantially the same limitations as apparatus claim 9 and thus is deemed to patentably distinguish over '981 for the same reasons set forth above regarding claim 9. Claim 6 depends from claim 5 and carries all of its limitations and hence is likewise deemed to patentably distinguish over '981.

Method claim 7 sets forth substantially the same limitations as apparatus claim 11 and hence is deemed to patentably distinguish over '981 for the same reasons set forth above regarding claim 11.

Claim 8 depends from claim 7 and hence is likewise deemed to patentably distinguish over '981.

Claims 12-14 are apparatus claims which respectively recite substantially the same limitations as claims 9-11, in "means-plus-function" language.

Making reference to claim 12, the color correlation calculation means calculates parameters to be used in a function for estimating one kind of color

component from a different kind of color component within the region near the pixel of interest, which relates to step 3 of Figure 3, and estimating a color component non-existent in the pixel of interest by said function using the calculated parameters and a color component obtained in the pixel of interest, which is shown at step 5 of Fig. 3. The combination selection means selects one of the pluralities of combination averages as the non-existent color component for the pixel of interest based upon the color component estimated by the color correlation calculation means, which function is shown at step 13 of Figure 4.

As was recited above, the present invention provides color correlation calculation means for calculating parameters to be used and estimating a color component non-existent in the pixel of interest by a function using the calculated parameters. The weighting factor alpha(α) of '981 is not calculated per se and is not used as a parameter in a function but merely provides an indication ("0" or "1") which determines whether vertical interpolation or horizontal interpolation is preferred (see step 160 of Figure 4 in '981) in order to perform the proper type of interpolation at interpolation logic 170. To the contrary, the present invention calculates parameters to be used in the function and then estimates a color component non-existent in the pixel of interest and employing a color component obtained in the pixel of interest which is then used to select one of the pluralities of

combination averages. This arrangement is neither taught nor remotely suggested by '981.

Claim 13 depends from claim 12 and hence is deemed to patentably distinguish over '981 for the same reasons set forth above regarding claim 12.

New claim 14 recites similar limitations to those set forth in claim 12.

New claims 15-20 all depend from claim 14 or from a claim which depends from claim 14 and hence are deemed to patentably distinguish over '981 for the same reasons set forth above. In addition, claims 15-20 are directed to the embodiment shown in Figure 9 of the present application wherein judgment regarding sub-regions each incorporating the pixel of interest and lying within a region of predetermined size (see 4 by 4 sub-regions 1-17 of Figs 11A-11c which lie within the 7 by 7 "region of predetermined size")." These features are not found in '981.

In view of the forgoing, it is submitted that claims 5-20 patentably distinguish over the art of record and reconsideration and allowance of these claims are earnestly solicited.
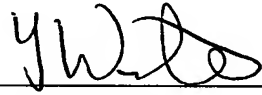
Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application, including claims 5 - 20, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

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